Amendment to the Claims

~~WE~~ I CLAIM:

1. (currently amended) A spin valve device comprising:

~~A~~ a ferromagnetic free layer whose magnetization changes in a magnetic signal field,

~~A~~ a ferromagnetic pinned layer whose magnetization remains unchanged in the magnetic signal field,

~~A~~ a single or a plurality of carbon nanotubes reside between ~~the~~ said ferromagnetic free layer and said pinned layer, and are in electrical contact with the two, wherein ~~The nanotubes~~ said carbon nanotube each having a substantially cylindrical wall, having a submicron diameter, ~~and~~ a length measured in a direction perpendicular to the diameter, and the length being greater than the diameter,

wherein the plane of ~~the~~ said ferromagnetic pinned layer is parallel to the plane of ~~the~~ said free layer, and

~~the~~ said carbon nanotubes are vertically aligned and perpendicular to the planes of ~~the~~ said pinned and ~~the~~ said free layers, and

~~During the device operation,~~ an electrical current passes from one ferromagnetic layer to the other via ~~the~~ said carbon nanotubes during the device operation.

2. (currently amended) The spin valve device of claim 1, wherein ~~the~~ said carbon nanotubes are single wall nanotubes.

3. (currently amended) The spin valve device of claim 1, wherein ~~the~~ said ferromagnetic free layer is made of alloys selected from the group containing Ni, Fe, Co.

4. (currently amended) The spin valve device of claim 1, wherein ~~the~~ said spin valve device is a magnetic recording read head.

5. (currently amended) The magnetic recording read head of claim 4, wherein

~~The~~ said ferromagnetic free layer is between two soft magnetic shields, and

~~The~~ said ferromagnetic pinned layer is not between the two soft magnetic shields, and

~~A~~ said single or ~~a~~ plurality of vertically aligned carbon nanotubes reside between ~~the~~ said free layer and ~~the~~ said pinned layer, ~~extend~~ extending through the thickness of one of the shields.

6. (currently amended) The magnetic recording read head of claim 4, wherein the spin valve ~~fabrication processes~~ is fabricated by a process comprising:

~~Growth of~~ growing carbon nanotubes on patterned free layer by chemical vapor deposition, and

~~Deposition of~~ depositing an insulation layer, and

~~Deposition of~~ depositing a soft magnetic shield layer, and

~~Chemical~~ chemical mechanical polishing ~~of the~~ said shield layer and exposing the top of said carbon nanotubes, and

~~Deposition~~ depositing and patterning ~~of~~ said ferromagnetic pinned layer.

7. (currently amended) The spin valve device of claim 1, wherein ~~the~~ said spin valve is included in a magnetic random access memory (MRAM) cell.

8. (currently amended) The MRAM cell of claim 7, wherein the spin valve ~~fabrication processes~~ is fabricated by a process comprising:

~~Growth of~~ growing carbon nanotubes on patterned free layer by chemical vapor deposition, and

~~Deposition of~~ depositing an insulation layer, and

~~Chemical~~ chemical mechanical polishing of ~~the~~ said insulation layer and exposing the top of carbon nanotubes, and

~~Deposition~~ depositing and patterning ~~of~~ said ferromagnetic pinned layer.

9. (currently amended) A spin valve device comprising:

~~A~~ a ferromagnetic free layer whose magnetization changes in a magnetic signal field,

~~A~~ a ferromagnetic pinned layer whose magnetization remains unchanged in the magnetic signal field,

~~A~~ a single or a plurality of carbon nanotubes reside between the said ferromagnetic free layer and said pinned layer, and are in electrical contact with the two, wherein ~~The nanotubes~~ said carbon nanotubes each having a substantially cylindrical wall, having a submicron diameter, ~~and~~ a length measured in a direction perpendicular to the diameter, and the length being greater than the diameter,

wherein ~~The~~ said ferromagnetic pinned layer resides substantially in the same plane of ~~the~~ said free layer, and

~~The~~ said carbon nanotubes are in-plane aligned and are substantially in the same plane of ~~the~~ said pinned and ~~the~~ said free layers, and

~~During the device operation,~~ an electrical current passes from one ferromagnetic layer to

the other via ~~the~~ said carbon nanotubes during the device operation.

10. (currently amended) The spin valve device of claim 9, wherein ~~the~~ said carbon nanotubes are single wall nanotubes.

11. (currently amended) The spin valve device of claim 9, wherein ~~the~~ said ferromagnetic free layer and pinned layer are made of alloys selected from the group containing Ni, Fe, Co.

12. (currently amended) The spin valve device of claim 9, wherein ~~the~~ said spin valve device is a magnetic recording read head.

13. (currently amended) The magnetic recording read head of claim 12, wherein

~~The~~ said ferromagnetic free layer is exposed to the air bearing surface, and resides between two soft magnetic shields,

~~The~~ said ferromagnetic pinned layer is recessed from the air bearing surface, and does not overlap ~~the~~ said free layer,

~~A~~ said single or ~~a~~ plurality of in-plane aligned carbon nanotubes reside between ~~the~~ said free layer and ~~the~~ said pinned layer, and are aligned in a direction substantially perpendicular to the air bearing surface.

14. (currently amended)The magnetic recording read head of claim 12, wherein the spin valve ~~fabrication processes~~ is fabricated by a process comprising:

~~Patterning of~~ patterning ~~a~~ said ferromagnetic free layer and ~~a~~ said ferromagnetic pinned layer, and

~~Growth of~~ growing in plane aligned carbon nanotubes between ~~the~~ said free layer and ~~the~~ said pinned layer by chemical vapor deposition.

15. (currently amended) The magnetic recording read head of claim 12, wherein the spin valve fabrication processes comprising:

~~Patterning of~~ patterning a ferromagnetic free layer and a ferromagnetic pinned layer, and

~~Assembling of~~ assembling carbon nanotubes between ~~the~~ said free layer and pinned layer.

16. (original) The spin valve device of claim 9, wherein the spin valve is included in a magnetic random access memory (MRAM) cell.

17. (currently amended) The MRAM cell of claim 16, wherein the spin valve ~~fabrication processes~~ is fabricated by a process comprising:

~~Growth of~~ growing carbon nanotubes on patterned free layer by chemical vapor deposition, and

~~Deposition of~~ depositing an insulation layer, and

~~Chemical~~ chemical mechanical polishing of ~~the~~ said insulation layer and exposing the top of carbon nanotubes, and

~~Deposition~~ depositing and patterning ~~of~~ said ferromagnetic pinned layer.

18. (currently amended) The MRAM cell of claim 16, wherein the spin valve ~~fabrication processes~~ is fabricated by a process comprising:

~~Patterning~~ patterning ~~of~~ a ferromagnetic free layer and a ferromagnetic pinned layer, and

~~Assembling~~ assembling ~~of~~ carbon nanotubes between ~~the~~ said free layer and said pinned layer.